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MINERAL INDUSTRY SURVEYS

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CHROMIUM IN JULY 1997

Chromite consumption increased slightly in July 1997 compared with the previous month's revised data, according to the U.S. Geological Survey. Net production of chromium ferroalloys and metal in July 1997 increased slightly compared with data for June 1997. Chromite stocks increased 5% over the same period. At the July rate of consumption, chromium stocks represented 6 months of domestic supply.

Included in this Mineral Industry Surveys are U.S. consumption and stocks of chromite; U.S. net production, net shipments, and stocks of chromium materials; U.S. Government inventory for July 1997; U.S. consumption by end use and consumer stocks of chromium ferroalloys and metal for June and July 1997; and foreign trade for June 1997.

Update

In 1996 and 1997, vertical integration of the South African chromium industry resulted in the expansion and planned expansion of ferrochromium production in South Africa using abundant supplies of domestic chromite ore and coal-based electrical energy. Japan continued to buy into the South African ferrochromium industry, joined by China and Korea. South Africa's ferrochromium industry expanded by about 30 percent to meet world demand driven by a growing stainless steel market and to meet local demand driven by recently installed or expanded stainless steel production facilities. Expansions and/or new plants added 6 furnaces comprising 239 megavolt-amperes in electrical energy capacity and 415,000 tons of annual ferrochromium production capacity. These additions to South Africa's ferrochromium production capacity are about 30 percent of 1995 capacity. In addition to production capacity resulting from the installation of new furnaces, South Africa increased its ferrochromium production capacity through the improvement of production process (e.g., ferrochromium from slag recovery and briquetting furnace feed materials).

The International Chromium Development Association (ICDA) has prepared a brief (four pages front and back) report entitled *Respiratory Health of Workers Exposed to Low Levels of Chromium in Stainless Steel Production* oriented to the general public. Copies are available upon request to ICDA while they last from the author of this Mineral Industry Surveys report. The purpose of the study was to determine whether long term occupational exposure to low levels of chromite, trivalent chromium, or hexavalent chromium causes respiratory disease, an excess of respiratory symptoms, a decrease in pulmonary function, or signs of pneumoconiosis among workers, and to investigate whether trivalent and hexavalent compounds differ in this respect. The report concluded that an average exposure time of 18 years in ferrochromium and stainless steel production and exposure to dusts containing low concentrations of hexavalent or trivalent chromium did not lead to any respiratory changes detectable by lung function tests or radiography nor to any increase in symptoms of respiratory diseases. The lung function values were lower and the occurrence of radiological findings was more frequent among the workers from the chromite mine than among the controls. The difference was partly caused by differences in age and smoking habits, but evidently also partly by higher exposures more than two decades ago or from the fibrous components of the dust.

On September 9, 1997, the Defense National Stockpile Center (DNSC) reported no awards of chemical or metallurgical grade chromite ore under Solicitation for Offers DLA-CHROMITE-001. This was the last sale under this solicitation, which is being withdrawn in favor of a new, long-term solicitation yet to be issued. For further information contact Rick Talbott of DNSC at (703) 767-5497.

Prepared by the Metals Section and the Data Collection and Coordination Section, September 23, 1997.

TABLE 1
U.S. SALIENT CHROMIUM STATISTICS 1/

(Metric tons, gross weight unless otherwise noted)

		1997				
	1996	May	June	2nd quarter	July	Jan. - July
Production:						
Chromium ferroalloys and metal: 2/						
Net production:						
Gross weight	36,800	5,800	5,810	16,900	6,180	36,600
Chromium content	26,400	3,890	3,880	11,200	4,160	25,000
Net shipments	38,800	6,590	6,750	18,100	6,440	39,600
Stainless steel production 3/	1,920,000	(4/)	(4/)	510,000	NA	996,000 5/
Components of U.S. supply:						
Stainless steel scrap receipts	579,000	61,500 r/	63,900 r/	191,000	36,800	404,000
Imports for consumption						
Chromite ore	250,000	58	3,210	35,300	NA	163,000 5/
Chromium ferroalloys 6/	469,000 r/	30,800	55,000	126,000	NA	198,000 5/
Chromium metals 7/	8,730	1,030	974	2,890	NA	5,190 5/
Stainless steel	781,000	(4/)	(4/)	510,000	NA	510,000 5/
Stainless steel scrap	50 r/	NA	NA	NA	NA	NA
Distribution of U.S. supply:						
Consumption:						
Chromite ore	282,000	30,500	29,700	90,900	30,000	197,000
Chromium ferroalloys & metal	333,000 r/	31,100	30,400	91,800	30,700	213,000
Exports:						
Chromite ore	69,400	1,230	643	3,700	NA	12,600 5/
Chromium ferroalloys	15,800	1,020	995	3,080	NA	5,530 5/
Chromium metals	1,330	387	251	1,020	NA	1,400 5/
Stainless steel	NA	NA	NA	NA	NA	NA
Stainless steel scrap	303	34	35	105	NA	168 5/
Stocks at end of period:						
Industry:						
Chromite ore:						
Chemical and metallurgical	165,000	159,000	167,000	167,000	151,000	XX
Refractory	7,890	8,930	8,640	8,640	8,420	XX
Total	173,000	168,000	176,000	176,000	160,000	XX
Chromium ferroalloys and metal:						
Producer	6,450	4,710	3,770	3,770	3,520	XX
Consumer	27,600 r/	21,800	20,700	20,700	20,800	XX
Government stockpile:						
Chromite ore	1,190,000	1,150,000	1,140,000	1,140,000	1,140,000	XX
Chromium ferroalloys	1,050,000	1,020,000	1,020,000	1,020,000	1,020,000	XX
Chromium metals	7,720	7,720	7,720	7,720	7,720	XX

r/ Revised. NA Not available. XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes low- and high-carbon ferrochromium, chromium concentrates, ferrochromium, chromium metal, and other miscellaneous alloys.

3/ Data on stainless steel production from American Iron and Steel Institute, quarterly production of stainless and heat resisting raw steel.

4/ Not reported monthly.

5/ Includes data for January through June; July not available at time of publication.

6/ Includes high-, medium-, and low- ferrochromium and ferrochromium silicon.

7/ Includes waste and scrap and other.

TABLE 2
U.S. CONSUMPTION, BY END USE, AND CONSUMER STOCKS OF
CHROMIUM FERROALLOYS AND METAL IN JUNE 1997 1/

(Metric tons, gross weight unless otherwise noted)

End use	Ferrochromium: Low-carbon	Ferrochromium: Medium- and high-carbon	Ferro-chromium silicon	Other	Total	Jan. through June total 2/
Steel:						
Carbon	379	359	9	W	748	4,010
Stainless and heat resisting	523	20,000	W	W	20,500	123,000
Full alloy	307	1,850	128	4	2,290	14,900
High-strength low-alloy and electric	185	W	619	--	804	5,280
Tool	W	412	W	--	412	2,070
Cast irons	W	161	W	W	161	662
Superalloys	192	512	--	279	982	4,880
Alloys:						
Welding materials 3/	--	W	W	6	6	62
Other alloys 4/	21	39	--	40	100	543
Miscellaneous and unspecified	170	313	3,810	57	4,350	26,600
Total: 5/ gross weight	1,780	23,700	4,570	386 6/	30,400	XX
Chromium content	1,190	13,900	1,650	343	17,100	XX
Stocks, June 30, 1997	1,690	17,700	1,000	272 7/	20,700	XX
Jan. through June: 2/						
Total	12,700	141,000	25,900	2,290 8/	XX	182,000
Chromium content	8,600	85,100	9,170	2,070	XX	105,000

W Withheld to avoid disclosing company proprietary data; included with "Miscellaneous and unspecified." XX Not applicable.
1/ Data are rounded to three significant digits; may not add to totals shown.
2/ Includes revised data from previous months.
3/ Includes structural and hard-facing materials.
4/ Includes magnetic, aluminum, copper, nickel, and other alloys.
5/ Includes estimates.
6/ Includes 333 tons of chromium metal.
7/ Includes 216 tons of chromium metal.
8/ Includes 1,870 tons of chromium metal.

TABLE 3
U.S. CONSUMPTION, BY END USE, AND CONSUMER STOCKS OF
CHROMIUM FERROALLOYS AND METAL IN JULY 1997 1/

(Metric tons, gross weight unless otherwise noted)

End use	Ferrochromium: Low-carbon	Ferrochromium: Medium- and high-carbon	Ferro-chromium silicon	Other	Total	Jan. through July total 2/
Steel:						
Carbon	365	338	8	5	716	4,720
Stainless and heat resisting	520	20,700	W	W	21,200	144,000
Full alloy	345	1,830	124	3	2,300	17,200
High-strength low-alloy and electric	183	W	573	--	757	6,040
Tool	W	457	W	--	457	2,530
Cast irons	W	50	W	W	50	712
Superalloys	191	474	--	322	986	5,870
Alloys:						
Welding materials 3/	--	10		6	16	78
Other alloys 4/	16	26	--	46	89	632
Miscellaneous and unspecified	184	386	3,540	35	4,140	30,800
Total: 5/ gross weight	1,800	24,200	4,240	416 6	30,700	XX
Chromium content	1,230	14,000	1,530	414	17,200	XX
Stocks, July 31, 1997	1,750	17,900	971	231 7	20,800	XX
Jan. through July: 2/						
Total	14,500	165,000	30,200	2,710 8	XX	213,000
Chromium content	9,830	99,100	10,700	2,490	XX	122,000

W Withheld to avoid disclosing company proprietary data; included with "Miscellaneous and unspecified." XX Not applicable.
1/ Data are rounded to three significant digits; may not add to totals shown.
2/ Includes revised data from previous months.
3/ Includes structural and hard-facing materials.
4/ Includes magnetic, aluminum, copper, nickel, and other alloys.
5/ Includes estimates.
6/ Includes 324 tons of chromium metal.
7/ Includes 170 tons of chromium metal.

TABLE 4
U.S. GOVERNMENT STOCKPILE INVENTORY 1/ OF CHROMIUM MATERIALS 2/

(Metric tons)

Period	Chromite ore			Chromium ferroalloys			Chromium metal	
	Chemical	Metal-lurgical	Refractory	High-carbon ferro-chromium	Low-carbon ferro-chromium	Ferro-chromium silicon	Alumino-thermic	Electrolytic
1996:								
July	220,000	655,000	322,000	738,000	283,000	52,900	2,670	5,020
August	220,000	655,000	322,000	738,000	283,000	52,900	2,670	5,020
September	220,000	647,000	322,000	734,000	283,000	52,700	2,670	5,050
October	220,000	645,000	322,000	732,000	283,000	52,700	2,670	5,050
November	220,000	645,000	322,000	725,000	283,000	52,700	2,670	5,050
December	220,000	645,000	322,000	718,000	283,000	52,700	2,670	5,050
1997:								
January	220,000	637,000	322,000	704,000	283,000	52,700	2,670	5,050
February	220,000	633,000	322,000	695,000	283,000	52,700	2,670	5,050
March	220,000	627,000	318,000	695,000	283,000	52,700	2,670	5,050
April	220,000	626,000	318,000	695,000	283,000	52,700	2,670	5,050
May	220,000	620,000	312,000	689,000	283,000	52,700	2,670	5,050
June	217,000	614,000	309,000	689,000	283,000	52,700	2,670	5,050
July	217,000	611,000	309,000	689,000	283,000	52,700	2,670	5,050

1/ Includes specification and non-specification grade materials and materials set aside for disposal but not yet shipped.
2/ Data are rounded to three significant digits.

Source: Defense National Stockpile Center.

TABLE 5
U.S. EXPORTS OF CHROMITE ORE, CHROMIUM FERROALLOYS AND METAL 1/

Period	Chromite ore		Chromium ferroalloys 2/			Chromium metal 3/	
	Gross weight (metric tons)	Value (thousands)	Gross weight (metric tons)	Chromium content (metric tons)	Value (thousands)	Gross weight (metric tons)	Value (thousands)
1996:							
June	37,900	$4,270	490	291	$583	143	$1,110
July	1,920	568	1,320	797	1,640	214	1,820
August	1,060	564	676	411	694	63	717
September	614	132	955	554	912	137	772
October	1,310	152	1,100	680	956	97	1,010
November	1,390	486	1,450	852	1,350	93	825
December	1,060	214	6,200	3,750	3,140	89	1,090
Jan.-Dec.	69,400	11,100	15,800	9,520	14,000	1,330	12,800
1997:							
January	1,540	364	635	405	718	60	600
February	5,930	977	975	609	1,160	142	1,120
March	1,480	487	841	527	939	180	1,260
April	1,830	376	1,060	561	1,300	379	2,610
May	1,230	237	1,020	585	1,030	387	2,820
June	643	131	995	589	1,090	251	1,840
Total	12,600	2,570	5,530	3,280	6,230	1,400	10,200

1/ Data are rounded to three significant digits; may not add to totals shown.
2/ Includes low-, medium-, and high-carbon ferrochromium, and ferrochromium-silicon.
3/ Includes wrought and unwrought and waste and scrap.

Source: Bureau of the Census.

TABLE 6
U.S. IMPORTS FOR CONSUMPTION OF CHROMITE ORE,
FERROCHROMIUM, AND CHROMIUM METAL 1/

(Metric tons)

		1997			
	1996	April	May	June	Jan.-June
Chromite ore:					
Not more than 40% chromic oxide:					
Gross weight	8,030	--	40	162	6,020
Chromic oxide content	2,650	--	14	19	1,960
More than 40% but less than 46% chromic oxide:					
Gross weight	25,400	14,200	18	--	14,300
Chromic oxide content	11,100	6,550	8	--	6,560
46% or more chromic oxide:					
Gross weight	217,000	17,700	--	3,050	143,000
Chromic oxide content	102,000	8,180	--	1,430	66,800
Total, all grades:					
Gross weight	250,000	32,000	58	3,210	163,000
Chromic oxide content	116,000	14,700	22	1,450	75,300
Ferrochromium:					
Low-carbon: 2/					
Gross weight	60,700	6,530	10,100	5,100	38,200
Chromium content	38,400	4,380	6,770	3,250	25,000
Medium-carbon: 3/					
Gross weight	36	--	210	--	227
Chromium content	23	--	137	--	148
High-carbon: 4/					
Gross weight	359,000	33,200	20,500	49,900	159,000
Chromium content	207,000	20,400	12,800	26,000	89,400
Total, all grades					
Gross weight	420,000	39,700	30,800	55,000	198,000
Chromium content	246,000	24,800	19,700	29,200	115,000
Chromium metal:					
Other than waste and scrap	8,670	892	1,030	974	5,190
Waste and scrap	67	--	1	--	3
Total, all grades	8,730	892	1,030	974	5,190

1/ Data are rounded to three significant digits; may not add to totals shown.
2/ Ferrochromium containing not more than 3% carbon.
3/ Ferrochromium containing more than 3% carbon but not more than 4% carbon.
4/ Ferrochromium containing more than 4% carbon.

Source: Bureau of the Census.

TABLE 7
U.S. IMPORTS FOR CONSUMPTION OF CHROMITE ORE IN JUNE 1997,
BY GRADE AND BY COUNTRY 1/

Country	June			January-June		
	Gross weight (metric tons)	Cr_2O_3 (metric tons)	Value 2/ (thousands)	Gross weight (metric tons)	Cr_2O_3 (metric tons)	Value 2/ (thousands)
Not more than 40% chromic oxide:						
China	--	--	--	20	7	$6
Philippines	--	--	--	5,780	1,910	1,050
South Africa	162	19	$26	202	35	32
Venezuela	--	--	--	20	7	6
Total	162	19	26	6,020	1,960	1,100
More than 40% but less than 46% chromic oxide:						
South Africa	--	--	--	14,300	6,560	1,070
46% or more chromic oxide:						
Canada				13	6	5
Russia	--	--	--	22	261	117
South Africa	3,050	1,430	1,980	143,000	66,500	10,800
Total	3,050	1,430	1,980	143,000	66,800	11,000
Total, all grades:						
Canada	--	--	--	13	6	5
China	--	--	--	20	7	6
Philippines	--	--	--	5,780	1,910	1,050
Russia	--	--	--	22	261	117
South Africa	3,210	1,450	2,010	157,000	73,100	11,900
Venezuela	--	--	--	20	7	6
Total	3,210	1,450	2,010	163,000	75,300	13,100

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Customs import value generally represents a value in the foreign country and therefore excludes U.S. import duties, freight, insurance and other charges incurred in bringing the merchandise to the United States.

Source: Bureau of the Census.

TABLE 8
U.S. IMPORTS FOR CONSUMPTION OF FERROCHROMIUM IN JUNE 1997,
BY GRADE AND BY COUNTRY 1/

Country	June			January-June		
	Gross weight (metric tons)	Chromium content (metric tons)	Value 2/ (thousands)	Gross weight (metric tons)	Chromium content (metric tons)	Value 2/ (thousands)
High-carbon ferrochromium: 3/						
Canada	--	--	--	20	9	$2
China	--	--	--	7,560	4,690	4,780
Croatia	--	--	--	3,000	2,000	1,240
India	3,850	2,370	$2,490	9,230	5,750	5,580
Kazakstan	--	--	--	262	193	445
Russia	18,200	8,020	13,200	28,100	11,900	21,000
South Africa	15,800	8,110	6,890	46,300	21,400	18,500
Turkey	12,100	7,480	7,650	41,200	28,500	25,700
United Kingdom	--	--	--	79	54	58
Zimbabwe	--	--	--	23,700	15,000	13,800
Total	49,900	26,000	30,300	159,000	89,400	91,200
Medium-carbon ferrochromium: 4/						
Russia	--	--	--	210	137	240
Switzerland	--	--	--	17	11	16
Total	--	--	--	227	148	256
Low-carbon ferrochromium: 5/						
China	--	--	--	1,970	1,290	2,440
Germany	482	341	1,370	5,660	3,960	14,400
Japan	17	NA	45	281	102	520
Kazakstan	312	203	406	1,300	845	1,560
Russia	2,830	1,900	3,760	20,100	13,600	25,800
South Africa	1,460	807	853	7,280	4,110	5,640
Turkey	--	--	--	100	73	164
Zimbabwe	--	--	--	1,560	1,040	1,890
Total	5,100	3,250	6,430	38,200	25,000	52,500
Total, all grades:						
Canada	--	--	--	20	9	2
China	--	--	--	9,520	5,980	7,220
Croatia	--	--	--	3,000	2,000	1,240
Germany	482	341	1,370	5,660	3,960	14,400
India	3,850	2,370	2,490	9,230	5,750	5,580
Japan	17	NA	45	281	102	520
Kazakstan	312	203	406	1,560	1,040	2,000
Russia	21,000	9,920	17,000	48,300	25,600	47,100
South Africa	17,200	8,910	7,750	53,500	25,500	24,200
Switzerland	--	--	--	17	11	16
Turkey	12,100	7,480	7,650	41,300	28,600	25,900
United Kingdom	--	--	--	79	54	58
Zimbabwe	--	--	--	25,200	16,000	15,700
Total	55,000	29,200	36,700	198,000	115,000	144,000

NA Not available.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Customs import value generally represents a value in the foreign country and therefore excludes U.S. import duties, freight, insurance and other charges incurred in bringing the merchandise to the United States.

3/ Ferrochromium containing more than 4% carbon.

4/ Ferrochromium containing more than 3% but not more than 4% carbon.

5/ Ferrochromium containing not more than 3% carbon.

Source: Bureau of the Census.

TABLE 9
U.S. IMPORTS FOR CONSUMPTION OF CHROMIUM METAL IN
JUNE 1997, BY GRADE AND BY COUNTRY 1/

Country	June		January-June	
	Gross weight (metric tons)	Value 2/ (thousands)	Gross weight (metric tons)	Value 2/ (thousands)
Waste and scrap:				
Canada	--	--	3	$14
Mexico	--	--	(3/)	2
Total	--	--	3	15
Other than waste and scrap:				
Belgium	--	--	18	115
Bulgaria	--	--	80	276
Canada	1	$2	1	3
China	228	1,320	1,260	7,360
France	170	1,320	887	7,240
Germany	9	113	28	367
Greece	1	7	1	7
Hong Kong	--	--	85	505
Italy	(3/)	5	1	14
Japan	8	582	117	3,190
Russia	420	2,610	1,920	12,100
Spain	--	--	3	3
Switzerland	(3/)	1	(3/)	24
Taiwan	(3/)	2	10	40
United Kingdom	137	1,120	775	6,570
Venezuela	--	--	(3/)	2
Total	974	7,090	5,190	37,800
Total, all grades:				
Belgium	--	--	18	115
Bulgaria	--	--	80	276
Canada	1	2	4	17
China	228	1,320	1,260	7,360
France	170	1,320	887	7,240
Germany	9	113	28	367
Greece	1	7	1	7
Hong Kong	--	--	85	505
Italy	(3/)	5	1	14
Japan	8	582	117	3,190
Mexico	--	--	(3/)	2
Russia	420	2,610	1,920	12,100
Spain	--	--	3	3
Switzerland	(3/)	1	(3/)	24
Taiwan	--	2	10	40
United Kingdom	137	1,120	775	6,570
Venezuela	--	--	--	2
Total	974	7,090	5,190	37,800

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Customs import value generally represents a value in the foreign country and therefore excludes U.S. import duties, freight, insurance and other charges incurred in bringing the merchandise into the United States.

3/ Less than 1/2 unit.

Source: Bureau of the Census.